

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

01 May 2000 (01.05.00)

International application No.

PCT/KR99/00514

Applicant's or agent's file reference

WA-251

International filing date (day/month/year)

03 September 1999 (03.09.99)

Priority date (day/month/year)

03 September 1998 (03.09.98)

Applicant

KIM, Sookwang et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

31 March 2000 (31.03.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

S. Mafla

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

SOHN, Eunjin
1F., Yeoksam P-Bldg.
824-17, Yeoksam-Dong
Seoul 135-080
RÉPUBLIQUE DE CORÉE

Date of mailing (day/month/year) 30 March 2001 (30.03.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WA-251	
International application No. PCT/KR99/00514	International filing date (day/month/year) 03 September 1999 (03.09.99)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input checked="" type="checkbox"/> the inventor	<input type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input type="checkbox"/> the name	<input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address LEE, Changhyun 102-1203 Kumho Apt. 827 Seojung-dong Pyongtaek-Si Kyongki-Do 459-010 Republic of Korea	State of Nationality KR	State of Residence KR
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary: Additional applicant/inventor for the purpose of the United States of America only.		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Dominique DELMAS
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

AGENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

SOHN, Eunjin
1F., Yeoksam P-Bldg.
824-17, Yeoksam-Dong
Seoul 135-080
RÉPUBLIQUE DE CORÉE

Date of mailing (day/month/year) 13 February 2001 (13.02.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference WA-251	
International application No. PCT/KR99/00514	International filing date (day/month/year) 03 September 1999 (03.09.99)

1. The following indications appeared on record concerning:		
<input type="checkbox"/> the applicant	<input type="checkbox"/> the inventor	<input checked="" type="checkbox"/> the agent
<input type="checkbox"/> the common representative		
Name and Address SOHN, Eunjin 301, Cambridge Bldg., 825-18, Yeoksam-Dong, Ka ngnam-Ku Seoul 135-080 Republic of Korea	State of Nationality	State of Residence
	Telephone No. 82-2-558-4466	
	Facsimile No. 82-2-554-2669	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input type="checkbox"/> the name	<input checked="" type="checkbox"/> the address
<input type="checkbox"/> the nationality		
<input type="checkbox"/> the residence		
Name and Address SOHN, Eunjin 1F., Yeoksam P-Bldg. 824-17, Yeoksam-Dong Seoul 135-080 Republic of Korea	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned	
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Dominique DELMAS
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

SOHN, Eunjin
No. 301, Cambridge Bldg., 825-18,
Yeoksam-Dong, Kangnam-Ku,
Seoul 135-080
Republic of Korea

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing
(day/month/year) 10 November 2000 (10.11.00)

Applicant's or agent's file reference
WA-251

REPLY DUE

within 1 months/days from
the above date of mailing

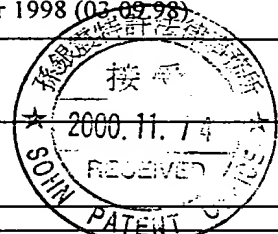
International application No.
PCT/KR 99/00514

International filing date (day/month/year)
03 September 1999 (03.09.99)

Priority date (day/month/year)
03 September 1998 (03.09.98)

International Patent Classification (IPC) or both national classification and IPC
IPC⁶: B 28 D 1/12

Applicant
EHWA DIAMOND IND. CO., LTD. et al.



1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I. ☒ Basis of the opinion
 - II. ☐ Priority
 - III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV. ☐ Lack of unity of invention
 - V. ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement
 - VI. ☐ Certain documents cited
 - VII. ☐ Certain defects in the international application
 - VIII. ☐ Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 03 January 2001 (03.01.01).

Name and mailing address of the IPEA/AT
Austrian Patent Office
Kohlmarkt 8-10; A-1014 Vienna

Authorized officer

Baumann

Facsimile No. 1/53424/200

Telephone No. 1/53424/360

WRITTEN OPINION

International application No.

PCT/KR 99/00514

I. Basis of the opinion

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as „originally filed“.

WRITTEN OPINION

International application No.
PCT/KR 99/00514

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

I. Statement

Novelty (N)	Claims	4-6,9-16	YES
	Claims	1-3,7,8	NO
Inventive step (IS)	Claims	4-6,9-16	YES
	Claims	1-3,7,8	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

I. Citations and explanations

Each one of the first three documents mentioned in the international search report, namely US 2 361 492 A, DE 24 38 601 A1 and GB 1 010 318 A, shows for itself all features of claim 1 and also all features of different subclaims as indicated in the search report.

Therefore the subject-matter of the totality of these claims, namely claims 1 – 3, 7 and 8, cannot be considered to be new and inventive.

The features of claims 4 – 6 are considered to be new and inventive, as they could not be found in all documents cited in the search report.

The fourth document of the search report, US 2 811 960 A, only shows few features of claim 9 as well as the other three documents mentioned before. The subject-matter of Claim 9 and the dependent claims 10 – 16 therefore is considered to be new and inventive.

Industrial applicability is obvious.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

SOHN, Eunjin
No. 301, Cambridge Bldg., 825-18,
Yeoksam-Dong, Kangnam-Ku,
Seoul 135-080
Republic of Korea

PCT

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

Date of mailing
(day/month/year) 6 Apr. 2000 (06.04.00)

Applicant's or agent's file reference
WA-251

IMPORTANT NOTIFICATION

International application No.
PCT / KR 99/00514

International filing date (day/month/year)
3 Sep. 1999 (03.09.99)

Priority date (day/month/year)
3 Sep. 1998 (03.09.98)

Applicant

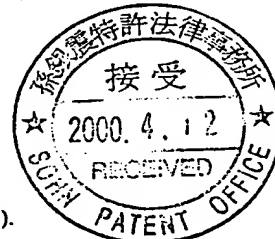
EHWA DIAMOND IND. CO., LTD. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

31 Mrz. 2000 (31.03.00)

2. That date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- ☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- ☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.



3. ☐ **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

- ☐ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/
AT
AUSTRIAN PATENT OFFICE
Kohlmarkt 8-10
A-1014 Vienna
Facsimile No. +43 / 1 / 534 24 - 200

Authorized officer
Koch
+43 / 1 / 534 24 - 450
Telephone No.

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ AT

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only	
AUSTRIAN PATENT OFFICE Identification of IPEA	31 March 2000 (31.03.00) Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION	
Applicant's or agent's file reference WA - 251	
International application No. PCT/KR99/00514	International filing date (day/month/year) 03 September 1999 (03. 09. 99)
(Earliest) Priority date (day/month/year) 03 September 1998 (03. 09. 98)	
Title of invention DIAMOND BLADE HAVING RIM TYPE CUTTING TIP FOR USE IN GRINDING OR CUTTING APPARATUS	
Box No. II APPLICANT(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
EHWA DIAMOND IND. CO., LTD. 520-2, Won-Dong, Osan-Si, Kyongki-Do 447-060 Republic of Korea	
Telephone No.: (0339)-370-9332	
Facsimile No.: (0339)-370-9338	
Teleprinter No.:	
State (that is, country) of nationality: KR	State (that is, country) of residence: KR
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
GENERAL TOOL, INC. 2025 Alton, Irvine, CA 92606 USA	
State (that is, country) of nationality: US	State (that is, country) of residence: US
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
KIM, Sookwang 18761 Portofino Dr. Irvine, CA 92612 USA	
State (that is, country) of nationality: KR	State (that is, country) of residence: US
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.	

Sheet No. 2...

International application No.
PCT/KR99/00514

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

YOON, Soyoung
23-1204 Hyundai Apt. Ichon-Dong,
Yongsan-Gu, Seoul 140-030 Republic of Korea

State (that is, country) of nationality:

KR

State (that is, country) of residence:

KR

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:



Further applicants are indicated on another continuation sheet.

Sheet No. 3 ..

International application No.
PCT/KR99/00514**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**The following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation.
The address must include postal code and name of country.)*SOHN, Eunjin
No. 301, Cambridge Bldg., 825-18,
Yeoksam-Dong, Kangnam-Ku,

Telephone No.:

(82)-(2)-558-4466

Facsimile No.:

(82)-(2)-554-2669

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☐ the international application as originally filedthe description ☐ as originally filed☒ as amended under Article 34the claims ☐ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☒ as amended under Article 34the drawings ☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69:1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

Sheet No. 4.

International application No.
PCT/KR99/00514

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of International preliminary examination:

- | | | |
|--------------------------------------------------------------------------|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary
Examining Authority use only

received not received

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- | | |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form |
| 3. <input checked="" type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (specify): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

SOHN, Eunjin



For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND: 31 March 2000 (31.03.00)

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

CHAPTER II

PCT

FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

International application No. PCT/KR99/00514	For International Preliminary Examining Authority use only
Applicant's or agent's file reference WA-251	Date stamp of the IPEA
Applicant EHWA DIAMOND IND. CO., LTD. ET AL.	
Calculation of prescribed fees	
1. Preliminary examination fee	ATS 2,200 P
2. Handling fee (Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is for all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)	ATS 2,022.76 H
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> ATS 4,222.76 </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 5px;"> TOTAL </div>
Mode of Payment	
<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash
<input type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps
<input type="checkbox"/> postal money order	<input checked="" type="checkbox"/> coupons bank transfer
<input type="checkbox"/> bank draft	<input type="checkbox"/> other (specify):
Deposit Account Authorization (this mode of payment may not be available at all IPEAs)	
The IPEA/ _____ <input type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account.	
<input type="checkbox"/> (this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit) is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.	
Deposit Account Number _____	Date (day/month/year) _____
Signature _____	

PCT REQUEST

WA-251

Original (for SUBMISSION) - printed on 03.09.1999 03:55:44 PM

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared using	PCT-EASY Version 2.84 (updated 01.07.1999)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	Korean Industrial Property Office (RO/KR)
0-7	Applicant's or agent's file reference	WA-251
I	Title of invention	DIAMOND BLADE HAVING RIM TYPE CUTTING TIP FOR USE IN GRINDING OR CUTTING APPARATUS
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	EHWA DIAMOND IND. CO., LTD.
II-5	Address:	520-2, Won-Dong, Osan-Si 447-060 Kyongki-Do Republic of Korea
II-6	State of nationality	KR
II-7	State of residence	KR
II-8	Telephone No.	0339-370-9332
II-9	Facsimile No.	0339-370-9338
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant only
III-1-2	Applicant for	all designated States except US
III-1-4	Name	GENERAL TOOL, INC.
III-1-5	Address:	2025 Alton IRVINE, CA 92606 United States of America
III-1-6	State of nationality	US
III-1-7	State of residence	US

PCT REQUEST

Original (for SUBMISSION) - printed on 03.09.1999 03:55:44 PM

III-2	Applicant and/or inventor	applicant and inventor US only KIM, Sookwang 18761 Portofino DR. IRVINE, CA 92612 United States of America KR US
III-2-1	This person is:	
III-2-2	Applicant for	
III-2-4	Name (LAST, First)	
III-2-5	Address:	
III-2-6	State of nationality	
III-2-7	State of residence	
III-3	Applicant and/or inventor	applicant and inventor US only YOON, Soyoung 23-1204 Hyndai Apt. Ichon-Dong, Yongsan-Gu 140-030 Seoul Republic of Korea KR KR
III-3-1	This person is:	
III-3-2	Applicant for	
III-3-4	Name (LAST, First)	
III-3-5	Address:	
III-3-6	State of nationality	
III-3-7	State of residence	
IV-1	Agent or common representative; or address for correspondence The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent SOHN, Eunjin No. 301, Cambridge Bldg., 825-18, Yeoksam-Dong, Kangnam-Ku 135-080 Seoul Republic of Korea 82-2-558-4466 82-2-554-2669 ejsohn@chollian.net
IV-1-1	Name (LAST, First)	
IV-1-2	Address:	
IV-1-3	Telephone No.	
IV-1-4	Facsimile No.	
IV-1-5	e-mail	

PCT REQUEST

3/4

WA-251

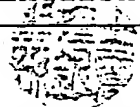
Original (for SUBMISSION) - printed on 03.09.1999 03:55:44 PM

V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AP: GH GM KE LS MW SD SL SZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT</p> <p>EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT</p> <p>EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT</p> <p>OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT</p>
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AE AL AM AT AU AZ BA BB BG BR BY CA CH&LI CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW</p>
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI-1	Priority claim of earlier national application	
VI-1-1	Filing date	03 September 1998 (03.09.1998)
VI-1-2	Number	1998-36321
VI-1-3	Country	KR
VII-1	International Searching Authority Chosen	Austrian Patent Office (ISA/AT)

PCT REQUEST

WA-251

Original (for SUBMISSION) - printed on 03.09.1999 03:55:44 PM

VIII	Check list	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	13	-
VIII-3	Claims	4	-
VIII-4	Abstract	1	rimtype-abstract.txt
VIII-5	Drawings	10	-
VIII-7	TOTAL	32	
	Accompanying items	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-9	Separate signed power of attorney	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract	4	
VIII-19	Language of filing of the international application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)	SOHN, Eunjin	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	JC08 Rec'd PCT/PTO 02 MAR 2001
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/AT
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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PCT (ANNEX - FEE CALCULATION SHEET)

WA-251

Draft (NOT for submission) - printed on 04.09.1999 12:25:51 PM

(This sheet is not part of and does not count as a sheet of the international application)

0	For receiving Office use only	
0-1	International Application No.	
0-2	Date stamp of the receiving Office	
0-4	Form - PCT/RO/101 (Annex)	
0-4-1	PCT Fee Calculation Sheet Prepared using	PCT-EASY Version 2.84 (updated 01.07.1999)
0-9	Applicant's or agent's file reference	WA-251
2	Applicant	EHWA DIAMOND IND. CO., LTD., et al.
12	Calculation of prescribed fees	fee amount/multiplier total amounts (KRW)
12-1	Transmittal fee T	⇒ 45,000
12-2	Search fee S	⇒ 213,100
12-3	International fee	
	Basic fee (first 30 sheets) b1	542,600
12-4	Remaining sheets	2
12-5	Additional amount (X)	12,500
12-6	Total additional amount b2	25,000
12-7	b1 + b2 = B	567,600
12-8	Designation fees	
	Number of designations contained in international application	81
12-9	Number of designation fees payable (maximum 10)	10
12-10	Amount of designation fee (X)	125,200
12-11	Total designation fees D	1,252,000
12-12	PCT-EASY fee reduction R	-167,000
12-13	Total International fee (B+D-R) I	⇒ 1,652,600
12-17	TOTAL FEES PAYABLE (T+S+I+P)	⇒ 1,910,700
12-19	Mode of payment	cash

VALIDATION LOG AND REMARKS

13-2-4	Validation messages Priority	Yellow! Priority 1: The twelve-month time limit for claiming priority would appear to have expired. Please verify.
13-2-6	Validation messages Contents	RedX The total number of pages of the international application has not been calculated. Select the "Calculate" button.

[별지 제57호 서식]

<p style="text-align: center;">NOTIFICATION OF CHANGE OF</p> <div style="display: flex; justify-content: flex-end; align-items: center;"> <input checked="" type="checkbox"/> APPLICANT <input type="checkbox"/> INVENTOR </div>							
<p>To : Commissioner of the Korean Industrial Property Office</p>							
International Application No.		PCT/KR99/00514					
Applicant	Name	EHWA DIAMOND IND. CO., LTD. ET AL	Residence Reg. No.		Country of Nationality	KR	
	Address	520-2, Won-Dong, Osan-Si, Kyongki-Do, 447-060 Republic of Korea					
Agent	Name	SOHN Eun Jin	Agent's Code	9-1998-0 00269-1	Tel. No.	566-4355	
	Address	1F., Yeoksam P-Bldg., 824-17, Yeoksam-Dong, Seoul 135-080, Republic of Korea					
Cause of Change		ADDITION					
Contents of Notifi- cation	Former	Name	EHWA DIAMOND IND. CO., LTD.	Residence Reg. No.		Country of Nationality	KR
		Address	520-2, Won-Dong, Osan-Si, Kyongki-Do, 447-060, Republic of Korea				
		Name	General Tool, Inc.	Residence Reg. No.		Country of Nationality	US
		Address	2025 Alton Irvine, CA 92606 USA				
		Name	KIM, Sookwang	Residence Reg. No.		Country of Nationality	KR
		Address	18761 Portofino Dr. Irvine, CA 92612 USA				
		Name	YOON, Soyoung	Residence Reg. No.		Country of Nationality	KR
		Address	23-1204 Hyndai Apt. Ichon-Dong, Yongsan-Gu, Seoul 140-030 Republic of Korea				

Contents of Notifi- cation	New	Name	EHWA DIAMOND IND. CO., LTD.	Residence Reg. No.		Country of Nationality	KR
		Address	520-2. Won-Dong, Osan-Si, Kyongki-Do, 447-060, Republic of Korea				
		Name	General Tool, Inc.	Residence Reg. No.		Country of Nationality	US
		Address	2025 Alton Irvine, CA 92606 USA				
		Name	KIM, Sookwang	Residence Reg. No.		Country of Nationality	KR
		Address	18761 Portofino Dr. Irvine, CA 92612 USA				
		Name	YOON, Soyoung	Residence Reg. No.		Country of Nationality	KR
		Address	23-1204 Hyndai Apt. Ichon-Dong, Yongsan-Gu, Seoul 140-030 Republic of Korea				
		Name	LEE. Changhyun	Residence Reg. No.		Country of Nationality	KR
		Address	102-1203 Kumho Apt., 827 Seojung-Dong, Pyongtaek-Si, Kyongki-Do, 459-010 Republic of Korea				

Submitted hereby is a notification pursuant to Article 82 of the Enforcement Regulations of the Patent Law.

Date(day/month/year) February 26, 2001

Applicant (Agent) SOHN Eun Jin (Seal)

※ Attached Document(s) :

1. A copy of the document(s) substantiating the power of attorney, if any

Power of Attorney

Agent(Common Representative)

Name : SOHN Eun Jin

Address : No.301, Cambridge Bldg., 825-18, Yeoksam-Dong
Kangnam-Ku, Seoul 135-080, Korea

I/We, the undersigned, do hereby appoint the above-identified agent(common representative) as my/our agent/common representative to act for me/us in proceedings concerning all of my/our International Application set forth below.

International Application No.: PCT/KR99/00514 (3 SEP. 1999)

Title of Invention: DIAMOND BLADE HAVING RIM TYPE CUTTING TIP FOR
USE IN GRINDING OR CUTTING APPARATUS

This 11th day of January, 2001

Applicant(s) 1) Name : LEE, Changhyun (SEAL)
Address : 102-1203 Kumho Apt., 827 Seojung-Dong,
Pyongtaek-Si. 459-010 Kyongki-Do. Republic
of Korea

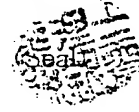
[별지 제57호서식]

NOTIFICATION OF CHANGE OF <input type="checkbox"/> APPLICANT <input checked="" type="checkbox"/> INVENTOR								
To : Commissioner of the Korean Industrial Property Office								
International Application No.			PCT/KR99/00514					
Applicant	Name	EHWA DIAMOND IND. CO., LTD. ET AL		Residence Reg. No.		Country of Nationality	KR	
	Address	520-2, Won-Dong, Osan-Si, Kyongki-Do, 447-060 Republic of Korea						
Agent	Name	SOHN Eun Jin		Agent's Code	9-1998-0 00269-1	Tel. No.	566-4355	
	Address	1F., Yeoksam P-Bldg., 824-17, Yeoksam-Dong, Seoul 135-080, Republic of Korea						
Cause of Change		ADDITION						
Contents of Notifi- cation	Former	Name	KIM, Sookwang		Residence Reg. No.		Country of Nationality	KR
		Address	18761 Portofino Dr. Irvine, CA 92612 USA					
		Name	YOON, Soyoung		Residence Reg. No.		Country of Nationality	KR
		Address	23-1204 Hyndai Apt. Ichon-Dong, Yongsan-Gu, Seoul 140-030 Republic of Korea					
Contents of Notifi- cation	New	Name	KIM, Sookwang		Residence Reg. No.		Country of Nationality	KR
		Address	18761 Portofino Dr. Irvine, CA 92612 USA					
		Name	YOON, Soyoung		Residence Reg. No.		Country of Nationality	KR
		Address	23-1204 Hyndai Apt. Ichon-Dong, Yongsan-Gu, Seoul 140-030 Republic of Korea					
		Name	LEE, Changhyun		Residence Reg. No.		Country of Nationality	KR
		Address	102-1203 Kumho Apt., 827 Seojung-Dong, Pyongtaek-Si, Kyongki-Do, 459-010 Republic of Korea					

Submitted hereby is a notification pursuant to Article 82 of the
Enforcement Regulations of the Patent Law.

Date(day/month/year) February 26, 2001

Applicant (Agent) SOHN Eun Jin



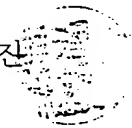
※ Attached Document(s) :

1. A copy of the reason

사 유 서

국제출원 제PCT/KR99/00514호(99년 9월 3일)의 발명자는 본래 KIM, Sookwang, YOON, Soyoung 및 LEE, Changhyun이었으나, 의뢰인의 착오로 발명자를 KIM, Sookwang 및 YOON, Soyoung 두명만으로하여 출원하였기에 이를 변경하고자 하오니, 발명자 변경신고서를 접수하여 주시기 바랍니다.

대리인 변리사 손은진



2001년 2월 26일

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference WA-251	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/KR 99/00514	International filing date (<i>day/month/year</i>) 03 September 1999 (03.09.99)	(Earliest) Priority Date (<i>day/month/year</i>) 03 September 1998 (03.09.98)
Applicant EHWA DIAMOND IND. CO., LTD et al.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.: 4

☒ as suggested by the applicant.

☐ None of the figures.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 99/00514

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁷: B 28 D 1/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: B 28 D 1/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2361492 A (PARÉ) 31 October 1944 (31.10.44) totality.	1,2,7 9 ✓
X A	DE 2438601 A1 (WINTER) 26 February 1976 (26.03.76) fig. 2, 3; page 6, line 1-5; page 6, line 15 - page 7, line 14.	1-3,7,8 9
X A	GB 1010318 A (BOART) 17 November 1965 (17.11.65) fig. 3, claims.	1-3,7 9
A	US 2811960 A (FESSEL) 05 November 1957 (05.11.57) totality.	9 ✓

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

30 November 1999 (30.11.99)

Date of mailing of the international search report

21 December 1999 (21.12.99)

Name and mailing address of the ISA/AT

Austrian Patent Office

Kohlmarkt 8-10; A-1014 Vienna

Facsimile No. 1/53424/200

Authorized officer

Baumann P.

Telephone No. 1/53424/360

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 99/00514

Im Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A 2361492		keine - none - rien	
DE A1 2438601	26-02-1976	keine - none - rien	
GB A 101031B		keine - none - rien	
US A 2811960		keine - none - rien	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 99/00514

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁷: B 28 D 1/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: B 28 D 1/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2361492 A (PARÉ) 31 October 1944 (31.10.44) totality.	1,2,7 9
X A	DE 2438601 A1 (WINTER) 26 February 1976 (26.03.76) fig. 2, 3; page 6, line 1-5; page 6, line 15 - page 7, line 14.	1-3,7,8 9
X A	GB 1010318 A (BOART) 17 November 1965 (17.11.65) fig. 3, claims.	1-3,7 9
A	US 2811960 A (FESSEL) 05 November 1957 (05.11.57) totality. ----	9

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

30 November 1999 (30.11.99)

Date of mailing of the international search report

21 December 1999 (21.12.99)

Name and mailing address of the ISA/AT
Austrian Patent Office
Kohlmarkt 8-10; A-1014 Vienna
Facsimile No. 1/53424/200

Authorized officer

Baumann P.

Telephone No. 1/53424/360

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 99/00514

Im Recherchenbericht angeführtes Patentedokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A 2361492		keine - none - rien	
DE A1 2438601	26-02-1976	keine - none - rien	
GB A 1010318		keine - none - rien	
US A 2811960		keine - none - rien	

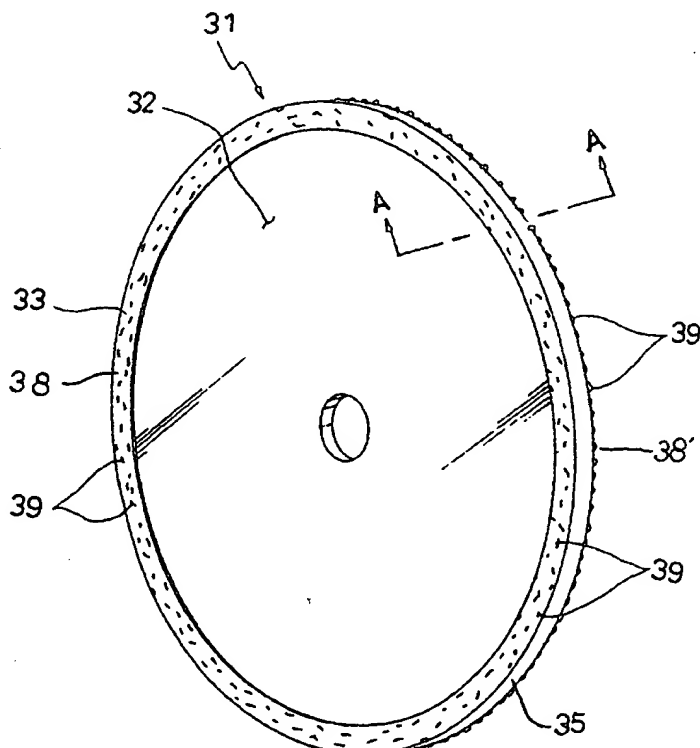
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : B28D 1/12		A1	(11) International Publication Number: WO 00/13868
			(43) International Publication Date: 16 March 2000 (16.03.00)
(21) International Application Number: PCT/KR99/00514 (22) International Filing Date: 3 September 1999 (03.09.99) (30) Priority Data: 1998/36321 3 September 1998 (03.09.98) KR (71) Applicants (for all designated States except US): EHWA DIAMOND IND. CO., LTD. [KR/KR]; 520-2, Won-Dong, Osan-Si, Kyongki-Do 447-060 (KR). GENERAL TOOL, INC. [US/US]; 2025 Alton, IRVINE, CA 92606 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): KIM, Sookwang [KR/US]; 18761 Portofino Dr., Irvine, CA 92612 (US). YOON, Soyoung [KR/KR]; 23-1204, Hyndai Apt. Ichon-Dong, Yongsan-Gu, Seoul 140-030 (KR). (74) Agent: SOHN, Eunjin; 301, Cambridge Bldg., 825-18, Yeok- sam-Dong, Ka ngnam-Ku, Seoul 135-080 (KR).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.	

(54) Title: DIAMOND BLADE HAVING RIM TYPE CUTTING TIP FOR USE IN GRINDING OR CUTTING APPARATUS

(57) Abstract

A diamond blade having rim type cutting tip for use in apparatus such as cutting saw machine having a structure which rim type cutting tip is able to produce cutting chips with relative large size during cutting operation so that those chips are easily discharged outside with reducing the friction with cutting tip of blade, thereby to increase cutting ability and to prevent the chips dispersing in the air and giving rise to the bad effects to user's health and the contamination of environment. The diamond blade according to the present invention comprises a wheel body connected with a shaft of electric motor, and rim type cutting tip for cutting or grinding crushable materials disposed on the circumference of the wheel body and composed of at least two diamond layers longitudinally disposed parallel with the rotation direction of the blade in which diamond particles are included, and non-diamond portion disposed between the diamond layers in which diamond particles are not included.



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Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
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BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
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CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

-1-

DIAMOND BLADE HAVING RIM TYPE CUTTING TIP FOR USE IN
GRINDING OR CUTTING APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to a diamond blade
5 for use in apparatus such as a cutting saw machine for
grinding or cutting crushable materials such as brick,
concrete, granite, marble, etc., and more particularly to
a diamond blade having rim type cutting tip in which at
least two diamond layers are longitudinally disposed along
10 the rotation direction of the blade to form microscopic
linear cutting grooves to cause portions of the crushable
materials between the cutting grooves to be crushed in
chips of relative large size by non-diamond portion of
the cutting tip during cutting operation and thereby to
15 enhance cutting ability of the blade and to prevent
crushed chips dispersing easily in the air and giving rise
to the bad effects to user's health and the contamination
of environment.

A conventional diamond blade 1 for use in apparatus
20 for cutting crushable materials such as cutting saw
machine comprises steel wheel body 2 connected with a
shaft of electric motor, and rim type cutting tip 3
disposed circumferentially and fixedly on the steel wheel
body 2, as shown in FIG. 1. Rim type cutting tip 3 is
25 fabricated by mixing particles of diamond and grinding
materials, particles of metals composing of cobalt,
nickel, bronze, copper, etc., and particles of resin or
ceramic and forming a rim of given shape out of the mixed
particles by plastic working including press work.

30 Thus, diamond particles 4 are randomly distributed in

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the inside and surfaces of rim type cutting tip 3 as shown in FIG. 3.

In the blade 1, upper surface of rim type cutting tip 3 contacts with corresponding surface portion of crushable materials 18 to be cut and grinds it to form cutting slot 16 in crushable materials during cutting operation as shown in FIG.3.

Minute chips produced by cutting operation of rim type cutting tip 3 are gathered in cutting slot 16 and then discharged from there to outside by the rotation of rim type cutting tip 3.

However, since the blade 1, i.e., upper surface of rim type cutting tip 3 has same shape and material composition on the whole, both edges 15 of upper surface contacting with side wall and bottom of cutting slot 16 formed in crushable materials 18 during cutting operation are defaced faster than center 17 thereof contacting only with bottom of cutting slot 16 of crushable materials 18.

Accordingly, the contacting area between upper surface of rim type cutting tip 3 and crushable materials 18 to be cut is enlarged to increase resistance of crushable materials 18 and thereby be able to induce poor cutting and decrease cutting ability and life of blade 1.

Further, since size of chips produced during cutting operation is very minute, these chips are easy to remain in cutting slot 16 of crushable materials 18 to prevent upper surface of rim type cutting tip 3 grinding bottom of cutting slot 16 and thereby decrease cutting ability. Also, in case of those minute chips discharged from cutting slot 16 are dispersed in the air, it gave rise

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to the bad effects to user's health and the contamination of environment.

To improve these problem, there has been proposed a diamond blade 11 that a plurality of depressed portions 19 are at given intervals formed in inner and outer surfaces of rim type cutting tip 13, as shown in FIG.2.

By virtue of this blade, discharging of minute chips remaining in cutting slot of crushable materials causing rim type cutting tip to be defaced during cutting operation has been improved, but defacement of both edges of upper surface to induce poor cutting and decrease cutting ability and life of blade, producing very minute chips to decrease cutting ability, and dispersing produced minute chips in the air to give rise to the bad effects to user's health and the contamination of environment are still remained in problems to solve.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a diamond blade for use in apparatus such as a cutting saw machine for cutting crushable materials such as brick, concrete, granite, marble, etc., having rim type cutting tip in which at least two diamond layers are longitudinally disposed along the rotation direction of the blade to form microscopic cutting grooves in the crushable materials during cutting operation and thereby to cause portion of crushable materials between the cutting grooves to be easily crushed by non-diamond portion of the rim type cutting tip to enhance cutting ability of the blade.

It is another object of the present invention to

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provide a diamond blade for use in apparatus such as cutting saw machine having a structure which rim type cutting tip is able to produce cutting chips with relative large size during cutting operation so that those chips are easily discharged outside with reducing the friction with cutting tip of blade, thereby to increase cutting ability and to prevent those chips dispersing in the air and giving rise to the bad effects to user's health and the contamination of environment.

10 It is the other object of the present invention to provide a diamond blade for use in apparatus such as cutting saw machine having rim type cutting tip which diamond particles in diamond layer thereof are distributed in a given pattern to reduce the amount of diamond particles used and thereby reduce the manufacturing cost of blade.

20 To accomplish these objects, a diamond blade for use in apparatus for grinding or cutting crushable materials according to the present invention comprises a wheel body connected with a shaft of electric motor, and rim type cutting tip for grinding or cutting crushable materials disposed on the circumference of wheel body and composed of at least two diamond layers longitudinally disposed parallel with the rotation direction of the blade in which diamond particles are included, and non-diamond portion disposed between the diamond layers in which diamond particles are not included.

25 In this embodiment of the present invention, diamond layers are disposed each other at predetermined intervals perpendicular with the rotation direction of the blade.

30 It is desirable that diamond layers are disposed only on inner and outer surface of rim type cutting tip.

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Alternatively, diamond particles in each diamond layer of rim type cutting tip are distributed in a given pattern or arrangement such a single or double layer figure with grid shaped spots.

5 Also, in the non-diamond portion of rim type cutting tip, diamond particles can be distributed in the density lower than that of diamond layers.

In the other embodiment of the present invention, a diamond blade for use in apparatus for grinding or cutting
10 crushable materials comprises a wheel body connected with a shaft of electric motor, and rim type cutting tip for grinding or cutting crushable materials disposed on the circumference of wheel body and composed of non-diamond portion having a plurality of depressed portions disposed
15 at predetermined intervals to cross each other in inner and outer surfaces of non-diamond portion, and a plurality of diamond layers longitudinally disposed parallel with the rotation direction of the blade respectively on bottom surfaces of depressed portions of non-diamond portion and
20 inner and outer surfaces of non-diamond portion divided by depressed portions thereof.

In this embodiment of the present invention, it is desirable that bottom surfaces of depressed portions of non-diamond portion are positioned in the plane forming
25 the center between inner and outer surfaces of non-diamond portion to let diamond layers disposed thereon to form one cutting line during the cutting operation of blade.

Also, the depth of all bottom surfaces of depressed portions of inner and outer surfaces of non-diamond
30 portion can be set up to be less than a half of the thickness of non-diamond portion to let diamond layers disposed thereon to form at least two linear cutting line

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during the cutting operation of blade.

BRIEF DESCRIPTION OF THE DRAWINGS

The above objects and other advantages of the present invention will become more apparent by describing in
5 detail preferred embodiments thereof with reference to the attached drawings in which:

FIG.1 is a front view of one conventional diamond blade for use in cutting saw machine in which diamond particles are randomly distributed in rim type cutting tip
10 thereof;

FIG.2 is a front view of the other conventional diamond blade in which diamond particles are randomly distributed in rim type cutting tip thereof and a plurality of depressed portions are disposed in inner and
15 outer surfaces of rim type cutting tip thereof;

FIG.3 is a partial cross-sectional view of the conventional diamond blade shown in FIG.1 to illustrate state in which rim type cutting tip thereof is operated;

FIG.4 is a perspective view of diamond blade for use
20 in cutting saw machine according to one preferred embodiment of the present invention which two diamond layers are longitudinally disposed respectively in inner and outer surfaces of non-diamond portion of rim type cutting tip to form two microscopic linear cutting grooves
25 in the crushable materials during cutting operation;

FIG.5 is a partial cross-sectional view of the diamond blade of the present invention taken along line A-A of FIG.4 to illustrate state which rim type diamond cutting tip is operated;

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FIG.6 is a perspective view of a diamond blade for use in cutting saw machine according to the other embodiment of the present invention in which a plurality of diamond layers are longitudinally disposed respectively on bottom surfaces of depressed portions of non-diamond portion and inner and outer surfaces of non-diamond portion and the depth of bottom surfaces of depressed portions of non-diamond portion is a half of the entire thickness of non-diamond portion;

FIG.7 is a partial cross-sectional view of the diamond blade of the present invention overlapping cross-sections taken along lines B-B and C-C of FIG.6 to illustrate state which rim type diamond cutting tip is operated;

FIG.8 is a perspective view of diamond blade of the present invention which the depth of bottom surfaces of depressed portions of non-diamond portion is less than a half of the entire thickness of non-diamond portion;

FIG.9 is a partial perspective view of diamond blade of the present invention shown in FIG.8; and

FIG.10 is a partial cross-sectional view of the diamond blade of the present invention overlapping cross-sections taken along lines E-E and F-F of FIG.9 to illustrate state which rim type diamond cutting tip is operated.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In several embodiments of this invention described below with reference to the accompanying drawings, the invention is applied to cutting saw machine.

Referring to FIG.4, there is illustrated diamond

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blade 31 having rim type cutting tip 33 according to one preferred embodiment of the present invention for use in apparatus for grinding or cutting crushable materials such as cutting saw machine.

5 Diamond blade 31 for cutting saw machine comprises wheel body 32 connected with a shaft of electric motor, and rim type cutting tip 33 for cutting or grinding crushable materials fixedly disposed circumferentially on the wheel body 32.

10 Rim type cutting tip 33 comprises two thin diamond layers 38 and 38' longitudinally disposed respectively in inner and outer surfaces thereof parallel with the rotation direction of the blade 31, and non-diamond portion 35 disposed between two diamond layers 38 and
15 38', as shown in FIG.4 and 5.

Thin diamond layers 38 and 38' are composed of particles of diamond and grinding material, particles of metals composing of cobalt, nickel, bronze, copper, etc., and particles of resin or ceramic.

20 Particles 39 of diamond in thin diamond layers 38 and 38' are randomly distributed, or in a given pattern or arrangement such a single or double layer figure with grid shaped spots to reduce the amount of diamond particles used.

25 Non-diamond portion 35 is composed of grinding materials, metals such as cobalt, nickel, bronze, copper, etc., and resin or ceramic.

Thin diamond layers 38 and 38' function to prevent edge area of upper surface of rim type cutting tip 33 defacing and to form two microscopic linear cutting
30 grooves 37' and 37" in the crushable materials 37 during cutting operation, as shown in FIG.5. Thus, portion 40 of

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crushable materials 37 between two cutting grooves 37' and 37" can be easily crushed by small friction and rotation impact power of non-diamond portion 35 and thereby non-diamond portion 35 of rim type cutting tip 33 is able to produce cutting chips with relative large size during cutting operation so that those chips are easily discharged outside with reducing the friction with rim type cutting tip 33 of blade, thereby to increase cutting ability and to prevent it dispersing in the air.

10 In this embodiment of the present invention, it is noted that rim type cutting tip 33 can be substituted by cutting tip composed of three or four thin diamond layers longitudinally disposed therein parallel with the rotation direction of the blade respectively to form three or four
15 microscopic linear cutting grooves in the crushable materials during cutting operation, and non-diamond portions disposed between the three or four diamond layers.

The diamond layers are each other disposed at
20 predetermined intervals perpendicular with the rotation direction of the blade between non-diamond portions of cutting tip.

In this case, portion of crushable materials between the microscopic linear cutting grooves can be easily
25 crushed by friction and rotation impact power smaller than that of non-diamond portion 35 of rim type cutting tip 33 having two thin diamond layers 38 and 38'.

Also, in the non-diamond portion of rim type cutting tip, diamond particles can be distributed in the density
30 lower than that of diamond layers of rim type cutting tip.

Referring to FIG.6 and 7, there are illustrated diamond blade 41 according to the other preferred

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embodiment of the present invention for use in apparatus for cutting and drilling crushable materials such as cutting saw machine.

Diamond blade 41 for cutting saw machine comprises wheel body 42 connected with a shaft of electric motor, and rim type cutting tip 43 disposed fixedly on the circumference of wheel body Rim type cutting tip 43 has non-diamond portion 45 having a plurality of depressed portions 44 disposed at predetermined intervals to cross each other in inner and outer surfaces of non-diamond portion 45.

Rim type cutting tip 43 further includes a plurality of diamond layers 48, 48', and 48" longitudinally disposed parallel with the rotation direction of the blade 41 respectively on bottom surfaces of depressed portions 44 of non-diamond portion 45 and inner and outer divided surfaces of non-diamond portion 45 divided by depressed portions 44, as shown in FIG. 6.

Bottom surfaces of depressed portions 44 of non-diamond portion 45 are positioned on the plane forming the center between inner and outer surfaces of non-diamond portions 45 to let diamond layers 48' disposed thereon to form one microscopic linear cutting groove 47" in crushable materials 47 during the cutting operation of blade 41, as shown in FIG.7.

Thus, diamond layers 48, 48', and 48" on bottom surfaces of depressed portions 44 of non-diamond portion 45 and inner and outer surfaces of non-diamond portion 45 form three microscopic linear cutting grooves 47', 47", 47"' in crushable materials 47 to let the protruded portions 50 and 50' of crushable materials 47 between the microscopic linear cutting grooves 47, 47', 47" to be

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easily crushed by small friction and rotation impact power of non-diamond portion 45 during the cutting operation of blade 41, as shown in FIG.7.

5 Also, in the non-diamond portion 45 of rim type cutting tip 43, diamond particles can be distributed in the density lower than that of diamond layers 48, 48' and 48".

10 Alternatively, in this embodiment of the present invention, the depth of bottom surfaces of depressed portions 54 in non-diamond portion 55 can be less than a half of the entire thickness of non-diamond portion 55 to let diamond layers 58' and 58" disposed thereon to form two microscopic linear cutting grooves 57" and 57"'

15 in crushable materials 57 during the cutting operation of blade 51, as shown in FIG.10.

20 Thus, in this case, diamond layers 58, 58', 58", and 58"' on inner and outer surfaces of non-diamond portion 55 and bottom surfaces of depressed portions 54 thereof form four microscopic linear cutting grooves 57', 57", 57"' and 57"" in crushable materials 57 to let protruded portions 60, 60' and 60" of crushable materials 57 between the cutting grooves 57', 57", 57"' and 57"" to be easily crushed by small friction and rotation impact power

25 of non-diamond portions 55 during the cutting operation of blade 51, as shown in FIG.10.

30 Operation of diamond blades having rim type cutting tip for use in apparatus such as cutting saw machine according to embodiments of the present invention will be described, hereinafter.

Referring to FIG.4, there is illustrated the operation of diamond blades 31 of one embodiment of the

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present invention which two thin diamond layers 38 and 38' are longitudinally disposed respectively in inner and outer surfaces of rim type cutting tip 33. At first, when wheel body 32 is rotated by an electric motor connected with a shaft thereof to cut crushable materials 37 such as brick, concrete, granite, marble, etc., cutting tip 33 begins to grind crushable materials 37 to form a cutting slot 36 therein along a predetermined line thereon.

At this time, since thin diamond layers 38 and 38' including particles 39 of diamond are disposed in inner and outer surfaces of cutting tip 33, both edges of cutting tip 33 are defaced less than center thereof and thereby two microscopic linear cutting grooves 37' and 37'' are formed in the cutting slot 36 of crushable materials 37, as shown in FIG. 5.

By forming cutting grooves 37' and 37'', portion 40 of crushable materials 37 therebetween is weakened and easily crushed by small friction and rotation impact power of non-diamond portion 35. Thus, non-diamond portion 35 of cutting tip 33 is able to produce cutting chips with relative large size and produced chips are easily discharged outside with reducing the friction with cutting tip 33 of blade 31, thereby to increase cutting ability and to prevent produced chips dispersing in the air.

In this way, by repeating the operation of cutting tip 33 of diamond blade 31, cutting crushable materials 37 along the predetermined line thereon is completed.

Referring to FIG.7 and 10, there are illustrated the operation of diamond blades 41 and 51 of the other embodiment of the present invention.

The operation of these diamond blades 41 and 51 is same that of the diamond blade 31 of embodiment

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noted above expect that diamond layers 48, 48", and 48", or 58, 58', 58", 58"', and 58"" on inner and outer surfaces of non-diamond portion 45 or 55 and bottom surfaces of depressed portions 44 or 54 form three or four linear cutting grooves 47', 47", and 47"', or 57', 57", 57"', and 57"" in crushable materials 47 or 57.

As apparent from the foregoing description, it can be appreciated that the present invention provides a diamond blade having rim type cutting tip which at least two diamond layers are longitudinally disposed along the rotation direction of the blade to form at least two microscopic linear cutting grooves in the crushable materials during cutting operation and thereby to cause portions of crushable materials between the cutting grooves to be easily crushed by non-diamond portions of cutting tip to enhance cutting ability of the blade.

Also, the present invention provides a diamond blade having a structure which cutting tip are able to produce cutting chips with relative large size during cutting operation so that those chip are easily discharged outside with reducing the friction with cutting tip of blade, thereby to increase cutting ability and to prevent it dispersing in the air and giving rise to the bad effects to user's health and the contamination of environment.

Also, the present invention provides a diamond blade having a rim type cutting tip which diamond particles in diamond layer thereof are distributed in a given pattern to reduce the amount of diamond particles used and thereby reduce the manufacturing cost of blade.

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What is claimed is:

1. A diamond blade having rim type cutting tip for use in grinding or cutting apparatus comprising ;
a wheel body connected with a shaft of electric motor,
5 and said rim type cutting tip for cutting or grinding crushable materials disposed on the circumference of said wheel body and composed of at least two diamond layers longitudinally disposed parallel with the rotation direction of the blade in which diamond particles are
10 included, and non-diamond portion disposed between the diamond layers in which diamond particles are not included.
2. A diamond blade as claimed in claim 1, wherein said diamond layers are each other disposed at predetermined
15 intervals perpendicular with the rotation direction of the blade between non-diamond portions of cutting tip.
3. A diamond blade as claimed in claim 1, wherein said diamond layers are only on inner and outer surface of rim type cutting tip.
- 20 4. A diamond blade as claimed in claim 1, wherein diamond particles in each diamond layer of rim type cutting tip are distributed in a given pattern or arrangement.
- 25 5. A diamond blade as claimed in claim 4, wherein diamond particles in each diamond layer of rim type cutting tip are distributed in single layer figure with grid shaped spots.

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6. A diamond blade as claimed in claim 4, wherein diamond particles in each diamond layer of rim type cutting tip are distributed in double layer figure with grid shaped spots.

5 7. A diamond blade as claimed in claim 1, wherein diamond particles in each diamond layer of rim type cutting tip are randomly distributed.

8. A diamond blade as claimed in claim 1, wherein in said non-diamond portion of rim type cutting tip, diamond
10 particles are distributed in the density lower than that of diamond layers.

9. A diamond blade having rim type cutting tip for use in cutting or grinding apparatus comprising ;
a wheel body connected with a shaft of electric
15 motor, and said rim type cutting tip for cutting or grinding crushable materials disposed on the circumference of said wheel body and composed of non-diamond portion having a plurality of depressed portions disposed at predetermined intervals to cross each other in inner and
20 outer surfaces of non-diamond portion, and a plurality of diamond layers longitudinally disposed parallel with the rotation direction of the blade respectively on bottom surfaces of depressed portions of non-diamond portion and inner and outer surfaces of non-diamond portion divided
25 by depressed portions thereof.

10. A diamond blade as claimed in claim 9, wherein all bottom surfaces of depressed portions of non-diamond portion are positioned in the plane forming the center

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between inner and outer surfaces of non-diamond portion to let diamond layers disposed thereon to form one cutting line during the cutting operation of blade.

11. A diamond blade as claimed in claim 9, wherein the
5 depth of all bottom surfaces of depressed portions of inner and outer surfaces of non-diamond portion is set up to be less than a half of the entire thickness of non-diamond portion to let diamond layers disposed thereon to form two linear cutting line during the cutting
10 operation of blade.

12. A diamond blade as claimed in claim 9, wherein diamond particles in each diamond layer of rim type cutting tip are distributed in a given pattern or arrangement.

13. A diamond blade as claimed in claim 12, wherein
15 diamond particles in each diamond layer of rim type cutting tip are distributed in single layer figure with grid shaped spots.

14. A diamond blade as claimed in claim 12, wherein
20 diamond particles in each diamond layer of rim type cutting tip are distributed in double layer figure with grid shaped spots.

15. A diamond blade as claimed in claim 9, wherein diamond particles in each diamond layer of rim type cutting tip are randomly distributed.

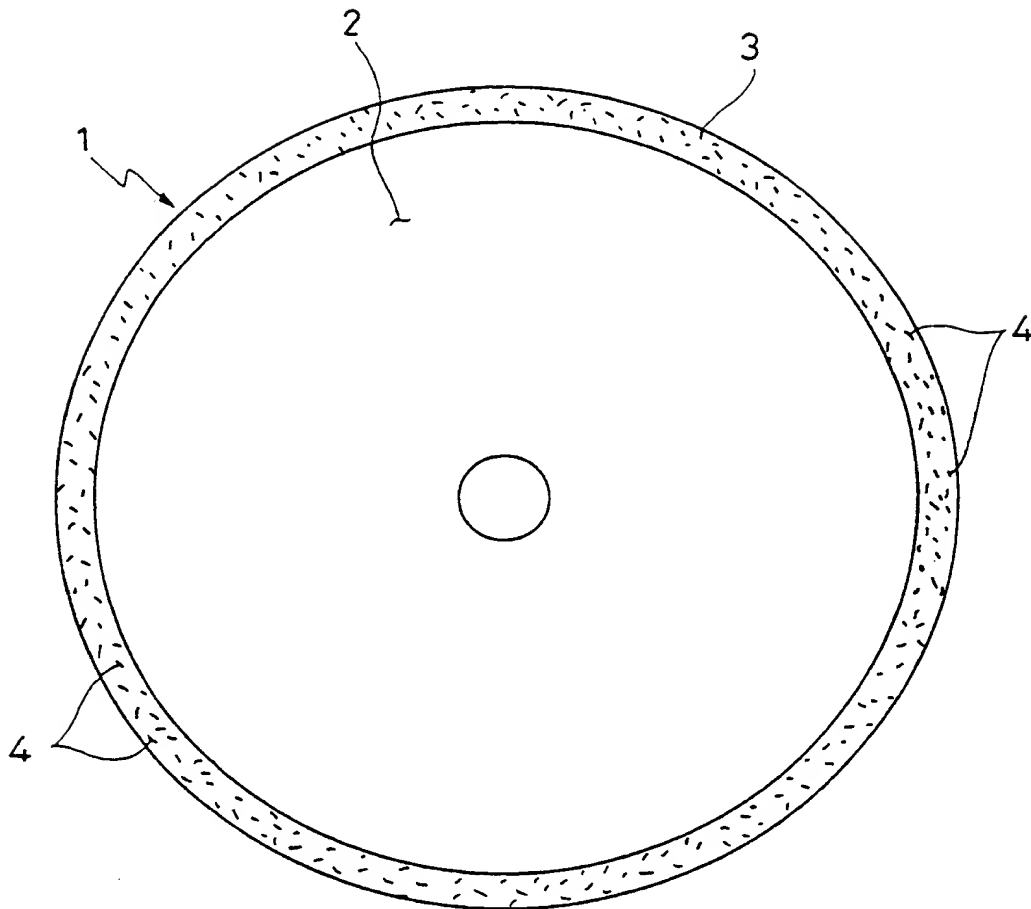
25 16. A diamond blade as claimed in claim 9, wherein in said non-diamond portion of rim type cutting tip, diamond

-17-

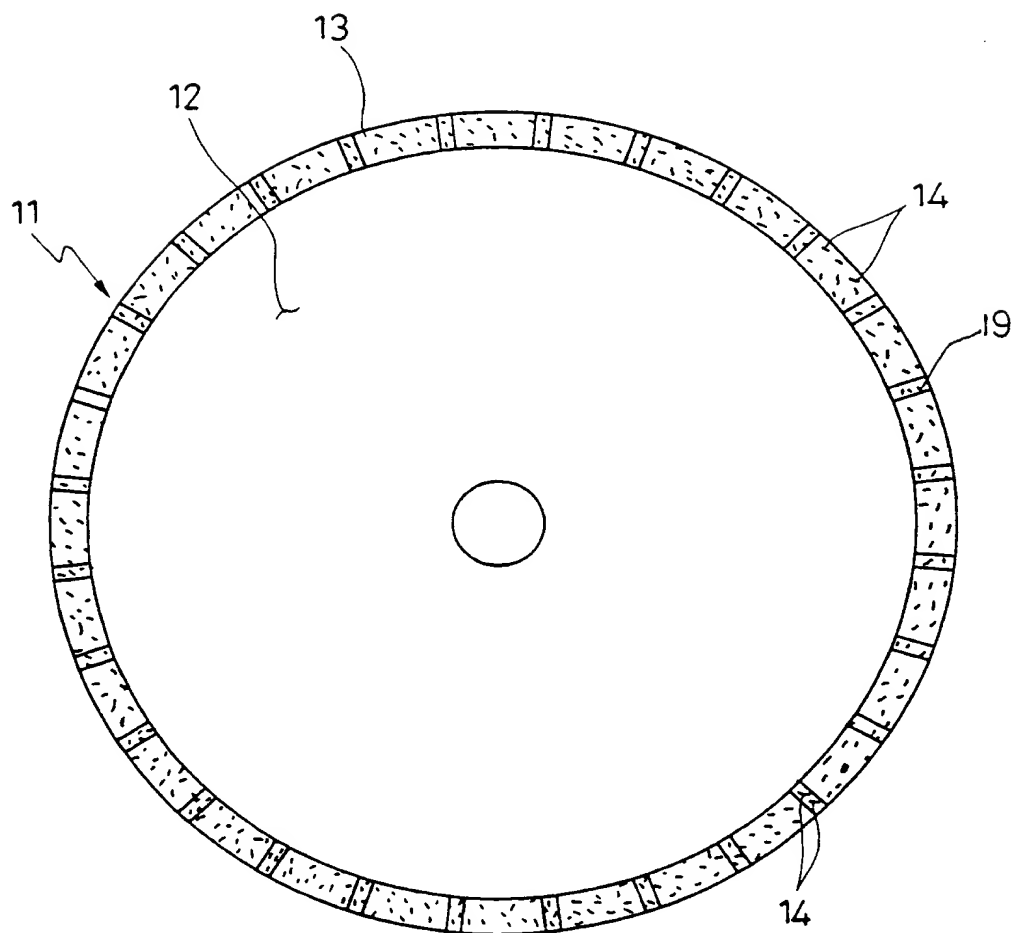
particles are distributed in the density lower than that of diamond layers.

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FIG.1
(PRIOR ART)

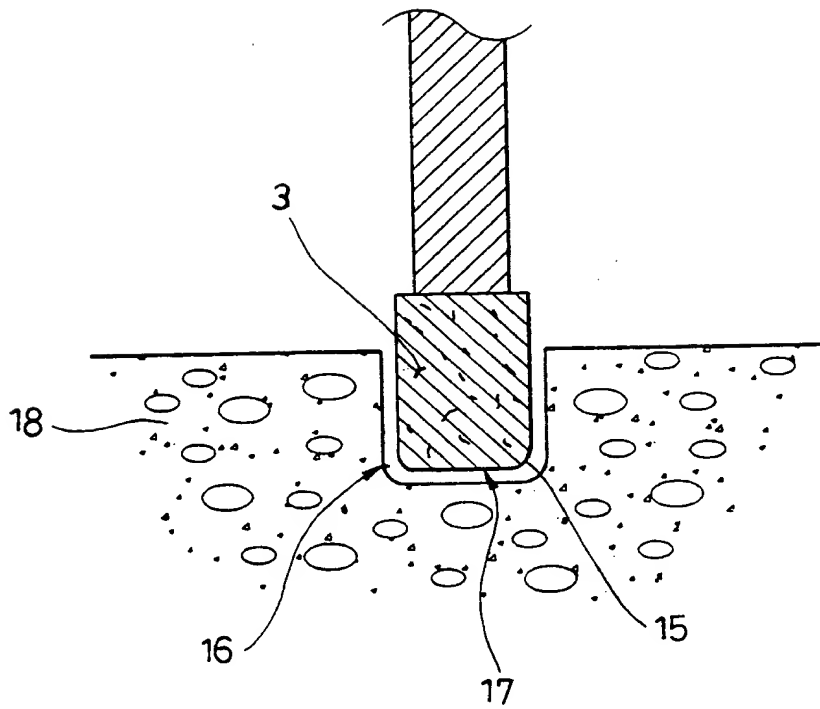


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FIG. 2
 (PRIOR ART)

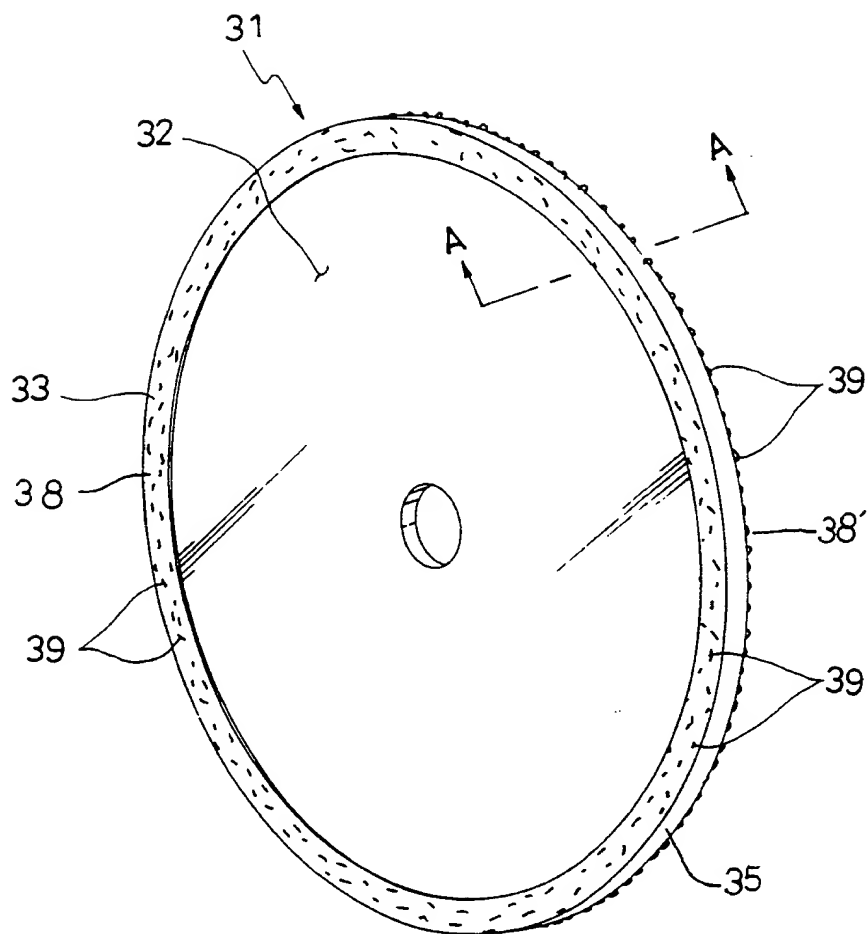


3/10

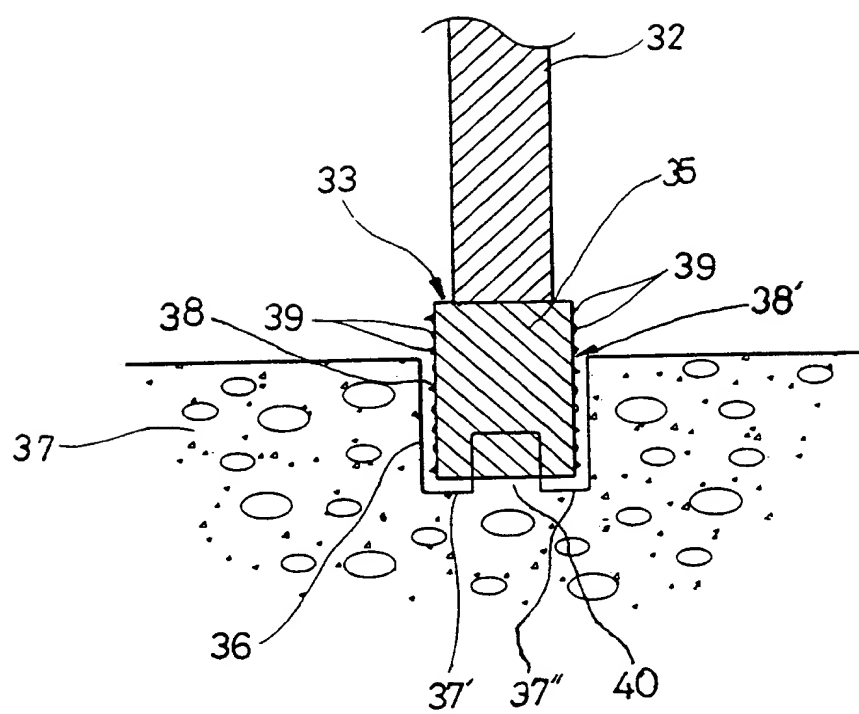
FIG.3
(PRIOR ART)



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FIG. 4

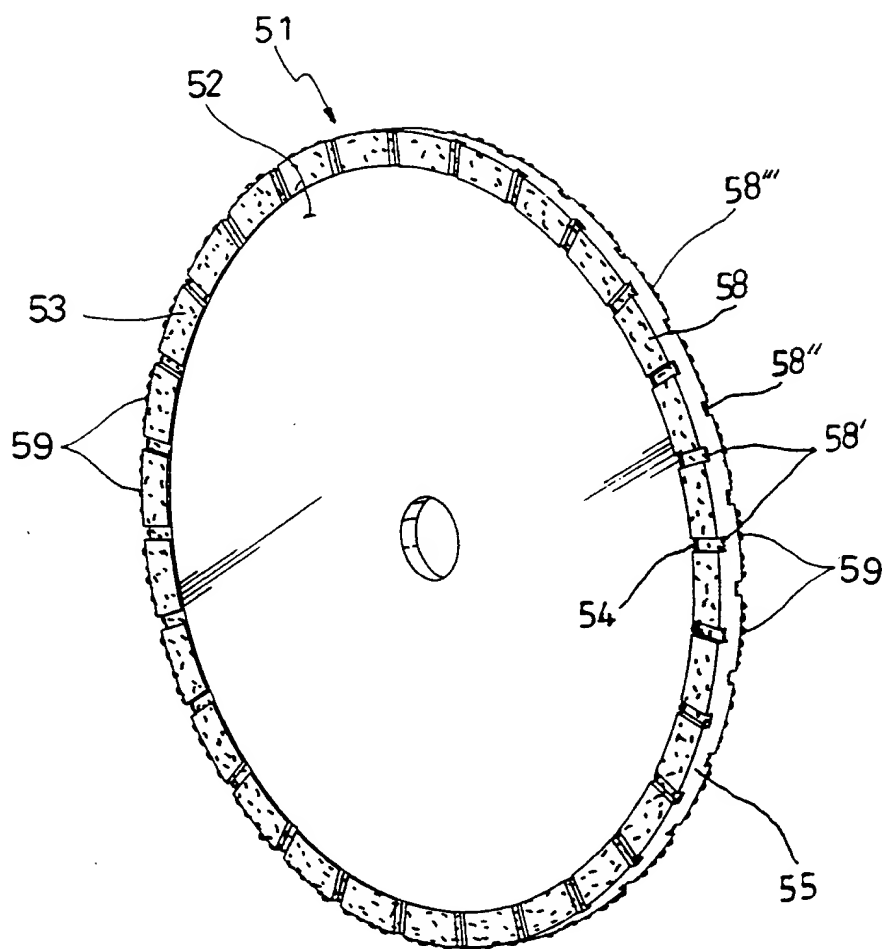


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FIG. 5

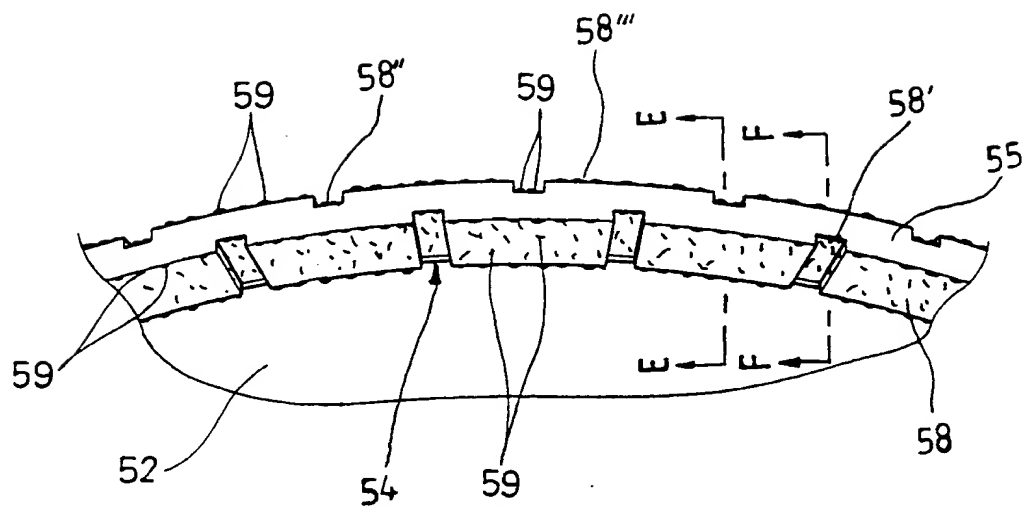
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FIG. 8



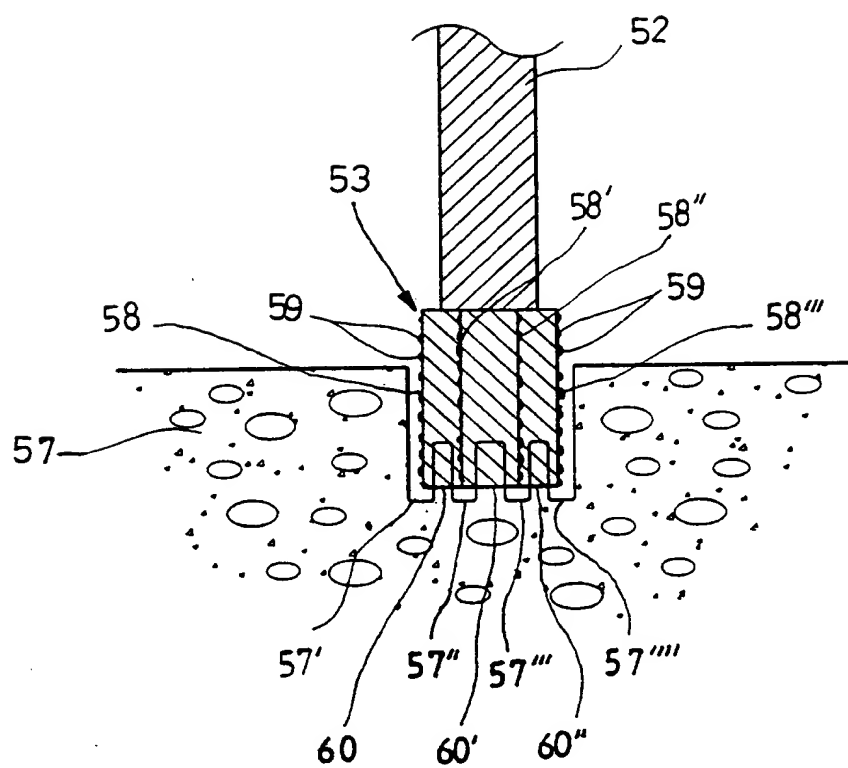
9/10

FIG. 9



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FIG. 10



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 99/00514

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁷: B 28 D 1/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: B 28 D 1/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2361492 A (PARÉ) 31 October 1944 (31.10.44) totality.	1,2,7 9
X A	DE 2438601 A1 (WINTER) 26 February 1976 (26.03.76) fig. 2, 3; page 6, line 1-5; page 6, line 15 - page 7, line 14.	1-3,7,8 9
X A	GB 1010318 A (BOART) 17 November 1965 (17.11.65) fig. 3, claims.	1-3,7 9
A	US 2811960 A (FESSEL) 05 November 1957 (05.11.57) totality. ----	9

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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„E“ earlier application or patent but published on or after the international filing date

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„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

30 November 1999 (30.11.99)

Date of mailing of the international search report

21 December 1999 (21.12.99)

Name and mailing address of the ISA/AT

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Authorized officer

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Telephone No. 1/53424/360

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 99/00514

Im Recherchenbericht angeführtes Patentedokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A 2361492		keine - none - rien	
DE A1 2438501	26-02-1976	keine - none - rien	
GB A 101031B		keine - none - rien	
US A 2811960		keine - none - rien	